Space Weather Forecast

Issued on Saturday, 25 December 2021 at 12:42 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Slight chance of G1/Minor Storms on 27 December. Chance of Moderate flares (R1/R2 Radio Blackout), with slight chance of strong flares (R3 Radio Blackout).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low through the last 24 hours with numerous common class flares observed. There are 8 sunspot regions, which include two new regions. Region 2907 is about to disappear around the western limb, but the risk of significant flares from this region will remain for the next 24 hours or so. Regions 2916 and 2918 are also large regions which will be monitored for development. All other regions are small and magnetically simple, with some decay occurring.
A CME (coronal mass ejection was observed leaving the Sun close to the southwest limb early on 24 December, but modelling suggests that this is not Earth-directed.

Solar Wind / Geomagnetic Activity: Solar wind speeds have been slightly elevated. The total magnetic field strength was weak, with the important north-south component varying only weakly. Geomagnetic activity was Quiet (Kp 1-2).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is forecast throughout the period, with a chance of M-class flares and a slight chance of X-class flares. This is due to several active regions with significant flare potential.
Solar Wind / Geomagnetic Activity: There are two potentially Earth-directed CMEs forecast, with the 20 December CME now removed from the forecast. These two CMEs left the Sun on 21 and 22 December respectively and could glance the Earth on 26 or 27 December. A CME which left the Sun on 24 December is not forecast to affect the Earth. A coronal hole fast wind is forecast to affect the Earth from 27 December, with expected speeds of around 500km/s. Mainly Quiet geomagnetic activity is forecast through days 1 and 2, with a chance of Active and a slight chance of G1/Minor Storms on day 3 due to the coronal hole effects.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to stay at background with no solar radiation storms expected. Any significant flares could lead to this count rate increasing, but are still expected to stay below radiation storm level.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2021. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	30	30
Very Active	R3 to R5 X	No	15	15	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2021. All Rights Reserved.